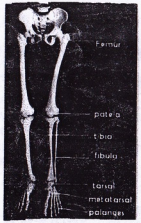


JOINTS

Connection between bones is called joint or articulation. There are 3 kinds of joints :

A. FIBROUS JOINT (SINARTROSIS) sendi mati

Joint connect bones without allowing any movement.

Example : skull joints, interconnection joints that makes pelvic girdle

B. CARTILAGINOUS JOINT (AMFIARTROSIS)

Joints allow only a little movement

Example : sternum & ribs joints, spinal column joint

C. SYNOVIAL JOINT (DIARTROSIS)

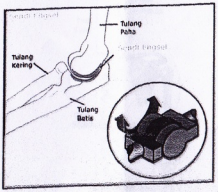
Joint allow move freely sendi gerak

There are 4 types of synovial joints :

a. Hinge joint

joints can only move to one single rotation

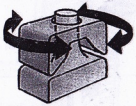
example : knee and elbow



b. Pivot joint

Enable one bone can rotation around another bo

Example : joint between occipital bone and axis


(a)


(b)

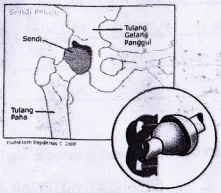
Sumber: koleksi pene

Gambar 2.20 (a) Sendi putar. (b) Contoh sendi putar pada kepala.

c. Ball and socket joints

Enable movement to all direction

Example : joint between femur and pelvic girdle, joint between humerus and pectoral girdle



d. saddle joints

It has shape like a horse saddle.

Example : joint between tha palm and hand knuckles

Sumber: koleksi penerbit

Gambar 2.21 (a) Sendi pelana. (b) Contoh sendi pelana pada telapak tangan.

THE WORKS OF MUSCLES

Muscles work to move bones in two ways :

a. antagonist (opposites)

Antagonist muscle is the work of two muscle which are opposed to each other. Example : biceps and triceps muscles.

b.synergistic

the work of two muscle simultaneously. The example is the pronator teres and pronator quadrates muscle.

Jose Revian
3F/17

HUMAN MOVEMENT SYSTEM

Function of skeleton are :

1. Inner organ protector
2. Supporter & provider of bodyshape.
3. Muscles reference place
4. storage of calcium and other nutrients
5. Place to form red blood cells

Type of bones in human is divided into 3 . are

1. BASED ON ITS SHAPES

There are 3 :

a. long / pipe bone

example: Upper and lower limbs

b. short bone

example : Carpals and Tarsals , Bones in Wrist

c. flat / lamellar bone

example : Ribs, Skull, sternum , Scapula

2. BASED ON ITS CONSTITUENT MATERIAL / TEXTURE

There are 2 :

a. compact bone, example : outer layer of long bone.

b.spongy bone, example : hip bone , chest bone

3. BASED ON ITS FORMER MATERIAL

There are 2 :

A. CARTILAGE

Cartilage is formed by chondrocyte (cartilage cell)

and matrix (basic) .

Cartilage matrix is composed of :

1. chondrin , collagen
2. less phosphor
3. less calcium

Based on the fiber competition within matrix, cartilage is divided into 3 :

1. hyaline cartilage

Color : white / transparant

Characteristic :stiff / kaku

Example :trachea wall, joints,between ribs and sternum

2. fibrous cartilage

Color : dark

Characteristics : strong and solid

Example : between the backbone section

3. elastic cartilage

Color : yellow

Characteristics : elastic and easily return to its original shape

Example : nose and ears

B. HARD BONE / BONE

Bone comes from cartilage that undergoes ossification

Ossification is bone formation process from cartilage to be hard bone

Hard bone formed by osteocyte that much dissolved matrix

The matrix contains :

1. a little collagen
2. much of Calcium
3. much of phosphor

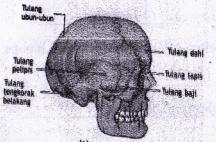
Skeleton can be classified into 2 groups :

1. Axial
2. Appendicular

It's flat. These bones protect the brain inside

SKULL, HEAD PART	QUANTITY
1. fontanel bone	2
2. brow bone	1
3. bone temple	2
4. wedge bone	2
5. bone filter	2
6. rear skull	1

SKULL, FACE PART	QUANTITY
1. Upper jaw bone	2
2. lower jaw bone	2
3. nasal bone	2
4. cheekbone	2
5.eye bone	2
6. bone tear	2

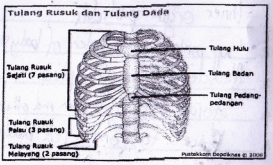


It' s a group of body forming bones, namely :

A. Backbone (vertebrae)

NAME OF VERTEBRAE	QUANTITY
1. Cervical vertebrae	7
2. Thoracic vertebrae	12
3. Lumbar vertebrae	5
4. Sacral vertebrae	5
5. Coccyx vertebrae	4

33 bones



B. Ribs

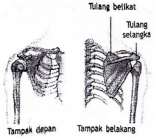
NAME OF RIBS	QUANTITY
1.true ribs	7 pairs
2. false ribs	3 pairs
3. floating ribs	2 pairs

C. sternum (breastbone)

NAME OF STERNUM	QUANTITY
1.Manubrium	1
2. Body	1
3. Xiphoid process	1

D. Pectoral girdle

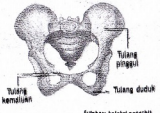
COMPONENTS OF PECTORAL GIRDLE	QUANTITY
1. Scapula (shoulder blade)	2
2. Clavicle (collarbone)	2



Sumber: koleksi penerbit

Gambar 2.13 Tulang-tulang yang menyusun tulang gelang bahu.

E. Pelvic girdle



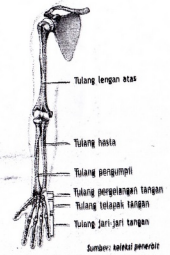
Sumber: koleksi penerbit

Gambar 2.14 Tulang-tulang yang menyusun gelang panggul.

COMPONENTS OF PELVIC GIRDLE	QUANTITY
1. Coxal bones (hipbones)	2
2. Tschium	2
3. Pubic bone	2

3. LIMB BONES

Consist of upper and lower limb.



Sumber: koleksi penerbit

Gambar 2.15 Tulang anggota gerak bagian atas (tangan atau lengan).

UPPER LIMB

NAME OF UPPER LIMB	QUANTITY
1. Upper arm (humerus)	2
2. Lower arm :	
- radius	2
- ulna	2
3. Carpals	16
4. Metacarpals	10
5. Phalanges	28

LOWER LIMB

NAME OF LOWER LIMB	QUANTITY
1. Femur	2
2. Kneecap (patella)	2
3. Fibula	2
4. Tibia	2
5. Tarsals	14
6. Metatarsals	10
7. Phalanges	28